REMARKS

Claims 1-10 and 36 are pending in the above-referenced application. Applicants have amended Claim 1. Claims 11-35 and 37 were withdrawn in response to a restriction requirement, but Applicants reserve the right to file the canceled claims in a later field divisional application. Applicants request reexamination and reconsideration of the pending claims.

Claims 1-3, 5-10 and 36 are rejected under 35 U.S.C. 102(b) as being anticipated by Fuji (EP 0 786 767). Claims 1-3, 5-10 and 36 are rejected under 35 U.S.C. 102(e) as being anticipated by Asano (EP 0 969 452). Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over either Fuji or Asano in view of Kobayashi et al. documents ('985) or ('522). Applicants overcome the rejections as follows.

Consider the advantages of the spiral groove configuration for an optical disk recited in claim 1. Specifically, each high-frequency wobble superimposed on the low-frequency wobble defined by the groove is "formed from a parallel sinusoidal deviation of both walls of the spiral groove." Support for this limitation is shown, for example, in Applicants' Figure 4 wherein each high frequency wobble mark (HFWM) is shown as a sinusoidal deviation of the groove. In other words, the groove itself forms both a low frequency sinusoidal deviation and a high frequency sinusoidal deviation.

The Fuji reference stands in sharp contrast to such an arrangement because its high frequency sinusoidal deviation is merely a deviation of one side of the groove – see, e.g., Figures 1, 6, 10, 12, 15, 18, 25, and 26 in the Fuji reference. Thus, the abstract of the Fuji reference states "one of the sidewalls of a groove 2 is wobbled by a wobble signal." This difference has very significant ramifications regarding the relative advantages of Applicants' invention. Because Applicants wobble the groove itself, only one laser beam is required to cut the groove in the master disk that will be used to reproduce the optical disks having the HFWM-modulated spiral groove. In sharp contrast, Fuji requires two laser beams: one laser beam to cut the sidewall without the higher-frequency wobble and another laser beam to cut the sidewall with the higher-frequency wobble. See, e.g., Col. 25, line 28 through Col. 26, line 38 discussing a groove cutting device generating two light beams (one for each groove sidewall). Because Fuji requires two laser beams, its manufacture is much more complicated than that necessary for the groove recited in claim 1: the two laser beams must be carefully aligned, thereby necessitating expensive and complicated alignment means. In contrast,

Applicants can manufacture the groove recited in claim 1 using just a single laser beam as would be normally done to cut a conventional spiral groove, making manufacture substantially less expensive and complicated.

Yet another substantial advantage for the groove recited in claim 1 over the Fuji reference is that because Fuji deviates just a single sidewall, the amplitude of Fuji's higher-frequency wobble cannot be any greater than the thickness of the groove. In sharp contrast, because Applicants are wobbling the groove itself to create the high frequency wobble marks (thus the limitation that each high-frequency wobble superimposed on the low-frequency wobble defined by the groove is "formed from a parallel sinusoidal deviation of both walls of the spiral groove"), there is no groove-width-induced limitation on the amplitude of the high-frequency wobble recited in claim 1. This has important ramifications with respect to the signal-to-noise ratio resulting from the detection of the higher-frequency wobbles – Applicants can adjust their high-frequency wobble mark's amplitude appropriately to ensure that the signal-to-noise ratio is sufficient. This is particularly critical with respect to the use Applicants make of the resulting information field from the HFWMs, namely addressing. Because Fuji makes no teaching or suggestion for modifying its disclosure to provide these important advantages and features, claim 1 is patentable over the Fuji reference.

The Asano reference adds nothing further. All Asano discloses is the use of wobble marks "to indicate the beginning of data, the timing of signal/reproduction, and determining whether the laser beam in on the center line." Thus these marks are purely timing marks such that each detected mark is used for generation of a reference timing signal. See, e.g., Col. 12, lines 21 through 26, wherein Asano states: "The reproduced data amplified by reproduced signal amplify circuit 19 is also applied to address mark detection circuit 23 of the present invention. Address mark detection circuit 23 detects the address mark formed at the groove of the magneto-optical disk shown in Fig. 2 or 3 to generate a reference timing signal." In that regard, Applicants respectfully traverse the assertion by the Examiner that Asano on page 5, line 55 through column 6, line 23 describes the information field recited in claim 1. The only reference to digital data in that section of Asano is to the data stored on the disk, whose detection is assisted by the reference timing signal that is generated from the address marks. Accordingly, Asano makes no teaching or suggestion for the information field recited in claim 1.

The Kobayashi reference adds nothing further as it makes no disclosure whatsoever regarding the use of higher frequency wobble marks superimposed on a conventional wobble. Thus, claim 1 is patentable over the art of record

Because claims 2 – 10, and 36 depend either directly or indirectly upon claim 1, they are patentable over the art of record for at least the same reasons.

The Examiner has asked for clarification with respect to the phase relationship recited in claims 5 and 6. For example, consider Applicants' Figure 4, which illustrates two tracks i and i + 1 having, e.g., HFWMs at zero crossings 1 and 5, respectively. Each HFWM is in-phase with the corresponding HFWM. However, they could also have been made out-of phase – for example 180 degrees out of phase such that one HFWM is exactly the opposite of the other.

In addition, the informality noted by the Examiner with respect to claim 36 has been addressed.

CONCLUSION

For the above reasons, pending Claims 1 – 10, and 36 are in condition for allowance and allowance of the application is hereby solicited. If the Examiner has any questions or concerns, a telephone call to the undersigned at (949) 752-7040 is welcomed and encouraged.

Certification of Facsimile Transmission

I hereby certify that this paper is being facsimile transmitted to (703) 872-9306 at the U.S. Patent and Trademark Office on the date shown below.

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December 19, 2003
Date

Respectfully submitted,

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